

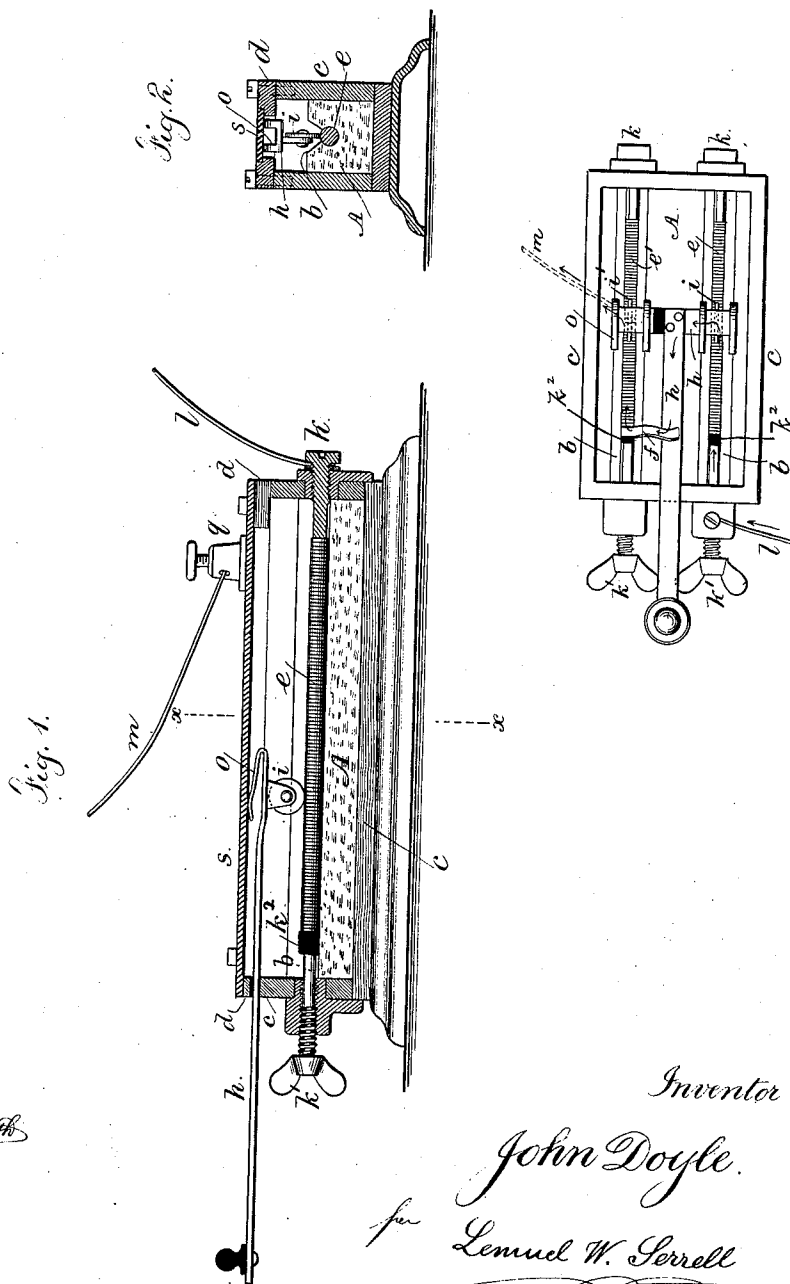
(No Model.)

J. DOYLE.

RHEOSTAT.

No. 298,073.

Patented May 6, 1884.



Witnesses

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UNITED STATES PATENT OFFICE.

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RHEOSTAT.

SPECIFICATION forming part of Letters Patent No. 298,073, dated May 6, 1884.

Application filed November 19, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN DOYLE, of Hoboken, in the county of Hudson and State of New Jersey, have invented an Improvement in Rheostats for Electric Lamps, &c., of which the following is a specification.

In electric lighting by incandescent lamps difficulty is experienced in reducing the light without risk of injury to the parts or the use of a large and expensive rheostat.

My improved rheostat is especially adapted to incandescent electric lamps for lessening the light whenever desired by throwing into the circuit more or less resistance. I make use of a range of disks or pieces of metal placed together within a holder of insulating material—such as asbestos—and combine therewith a sliding contact and circuit-connections, whereby more or less of such disks can be included in the electric circuit and more or less resistance be introduced to vary the current passing through the lamp.

In the drawings, Figure 1 is a longitudinal section of my rheostat. Fig. 2 is a cross-section at the line *xx*; and Fig. 3 is a plan view with the cover removed, illustrating a modification of my invention.

The holder *A* is of asbestos, plaster-of-paris, glass, or other suitable insulating material. Within this is a groove that is undercut, preferably, in the form of a circular hole slotted at one side, as at *b*. This holder is preferably contained in a box or case, *c*, of suitable material, with a removable lid, *d*. The sizes and shapes of these parts will be varied to suit the places where the rheostat is to be used.

Within the hole in the holder *A* there is a range of disks or pieces of aluminium or other sheet metal at *e*. I prefer to make use of copper disks, the surfaces of which are coated with powdered aluminium and subjected to pressure to cause the aluminium to penetrate the copper and adhere thereto. These disks or pieces are packed together, preferably flatwise, in the groove or hole of the holder and retained by the screws *k k'*, or other supports at the ends of the range of pieces. The screw *k'* is provided with wings, or, as shown, is what is called a "thumb-screw," and may be rotated to press the said disks more or less com-

pactly together. In practice I find that the greater the pressure there is on these disks the less the resistance to the current passing through the rheostat, and the reverse. It is preferable to pass the screw *k'* through a spring that will yield if the range of pieces expands by heat so as not materially to change the pressure. The spring may be of india-rubber or other suitable material, as shown at *k''*.

I make use of a traveling contact formed of the rod or plate *h*, with a wheel, *i*, or roller near one end, with spring-contacts *o* upon the rod *h*. The plate *s* is over the spring-contacts, and to it one pole or electrode of the circuit is connected, so that when this rod *h* is moved endwise the contact-roller moves over the edges of the disks or pieces *e*, and the springs *o* slide against the under surface of the plate *s*. The electric circuit is by the wire *l* to the screw *k*, and by the wire *m* to the binding-post *q* on the plate *s*, or else the wire *m* may be connected to the rod *h*. When the contact-rod *h* is drawn out, the maximum resistance is obtained, because the electric current passes by the wire *l* through the range of disks *e*, and by the roller *i* and springs *o* to the plate *s* and wire *q*. When the contact-rod *h* is pushed in, the current passes from the screw or support *k* to the wheel *i*, spring *o*, and plate *s*, without any appreciable resistance. The rheostat may be adjusted to any intermediate position to regulate the current passing to the lamp or other working device.

By employing two lines of disks, as seen in Fig. 4, the apparatus can be shortened and made smaller. In this case the conductor *l* is connected with the end of one range of disks or pieces, *e*, and the contact is made with two wheels or springs rubbing upon the edges of the disks or pieces *e e'*. These are insulated so that the wheel *i* and rod or plate *h* are in metallic contact, and the current passes along the range of disks *e* by the roller *i* and plate *h* to the contact-piece *f* at the end of the second range of disks, *e'*, thence through the same to the second wheel or roller, *i'*, and by the contact-spring *o* to the plate *s*, which is immediately over the range of pieces *e'*, and thence to the binding-post *q* and circuit-wire *m*. By moving the plate *h* and rollers *i i'* in

one direction, the resistance will be increased. By moving them in the other direction, the resistance will be lessened, in consequence of the number of plates or pieces of metal being lessened. Three or more lines of disks or pieces and the rollers may be used.

I have found that small disks of aluminium interpose a great resistance to the electric current in a small space, and that a greater resistance is produced by particles of aluminium embedded in copper or other metal disks, and that the total resistance will be varied or adjusted by the endwise pressure upon the line of disks by the screw, as aforesaid, or any other device for applying pressure.

The surfaces of the disks or pieces of metal may be coated with plumbago or other material which is a poor conductor of electricity.

The holder may be of mica or any other suitable material, and of any desired shape.

I claim as my invention—

1. The combination, with an insulating-holder having an opening therein, of a range of disks or pieces of metal placed together within such holder, a screw or other device to press the pieces together, a movable contact, and circuit-connections, substantially as set forth.

2. In a rheostat, a range of disks or pieces of metal having aluminium surfaces and a movable contact and circuit-connections, substantially as set forth.

3. The sliding contact formed of the plate *h*, roller *i*, and springs *o*, in combination with the plate *s*, the range of disks or pieces of metal, the holder for the same, and the circuit-connections, substantially as set forth.

Signed by me this 14th day of November, A. D. 1883.

JOHN DOYLE.

Witnesses:

GEO. T. PINCKNEY,
WILLIAM G. MOTT.